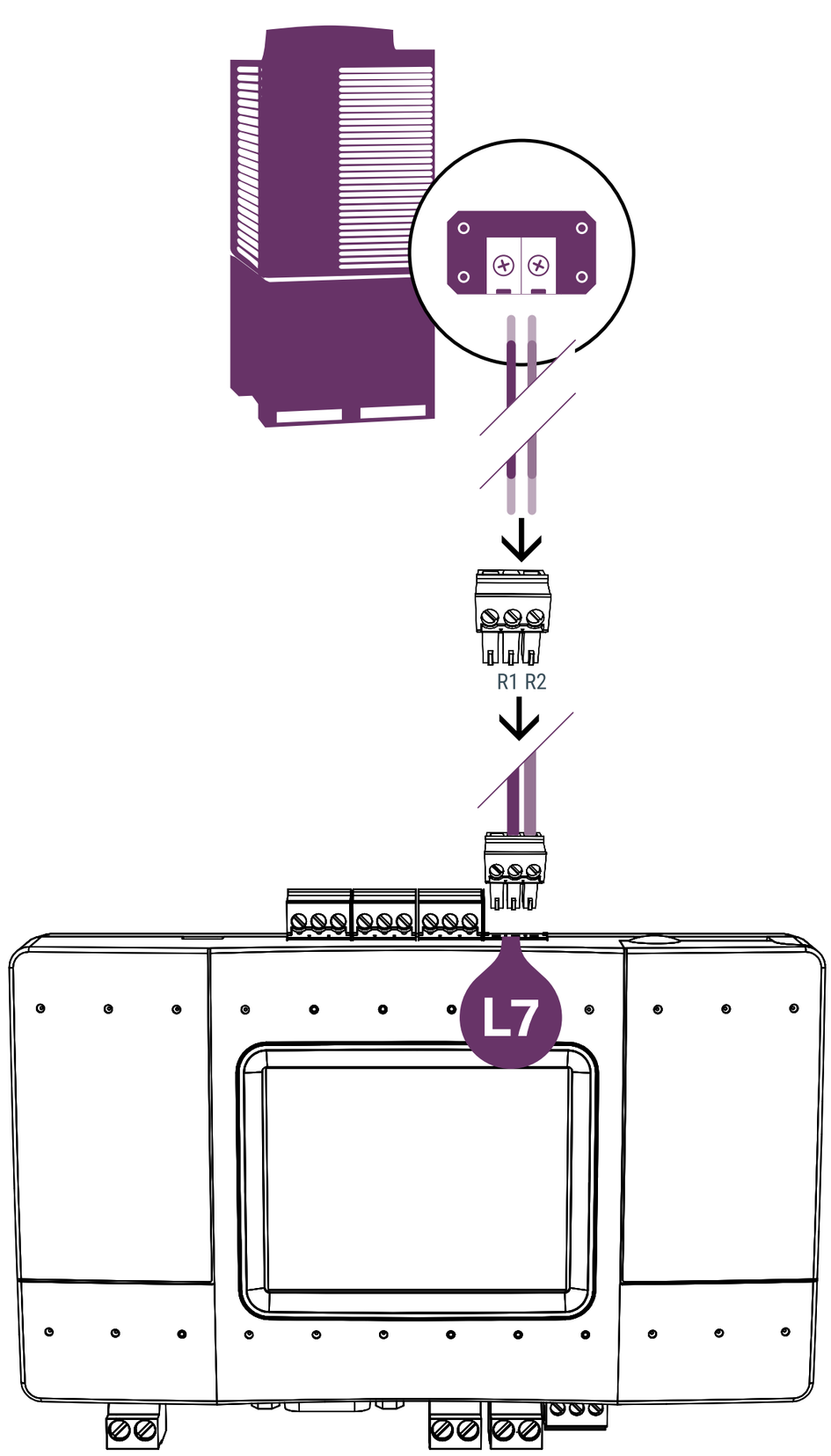
CoolMasterNET Integration Guide for Loxone - Control of Multiple Indoor Units From Outdoor Unit Over Modbus IP

Step 1: Connecting the CoolMaster to the outdoor unit.

Refer to the CoolMaster document found here https://coolautomation.com/wp-content/uploads/sites/2/2021/01/CoolMasterNET-installation-manual-3.5_.pdf for detailed instructions. DIP switches must be set appropriately for the HVAC units in use, then the outdoor unit comms line must be connected to the CoolMaster (only certain comms lines can be used for certain brands). The image below is for a Samsung outdoor unit.



The above connection would allow you to control up to 64 indoor units from a single connection to the outdoor unit. Refer to the manual of the HVAC unit for recommendations on cable used for this connection. For example a Samsung VRF unit recommends a cable gauge of 0.75mm to 1.5mm.

If there is a second outdoor unit, then simply connect this to another data line on the integration unit.

CoolMasterNET can be controlled through Loxone via Modbus RTU or Modbus IP, The registers are the same in either case. Modbus RTU will require a Loxone Modbus extension connected via twisted pair (e.g. Cat cable) to Line 3 - RS485 of the CoolMaster and Line 3 set to Modbus.

This guide is for control of the unit via Modbus IP, this will require no additional hardware from Loxone aside from the Miniserver, the CoolMaster will need to be connected via the LAN port to the same internal network as the Loxone Miniserver.

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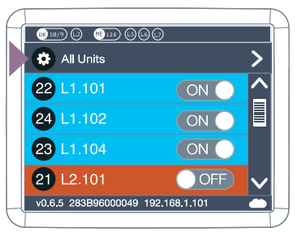
Step 2: Detecting the indoor units and assigning VA's (Virtual Addresses)

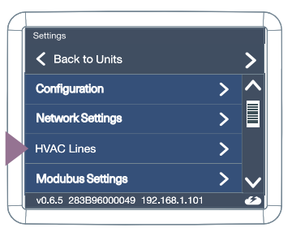
As the CoolMasterNET is capable of controlling multiple indoor units, to be able to offer a control mechanism over Modbus it assigns a Virtual Address to each indoor unit and then uses this address as the base address for the Modbus register of that unit. The Coolmaster is capable of auto scanning a particular line and detecting all indoor units connected to it.

Setting the correct HVAC brand.

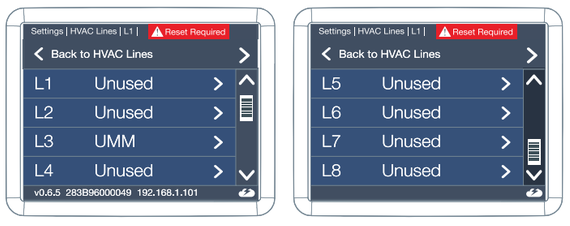
1 Go to Settings



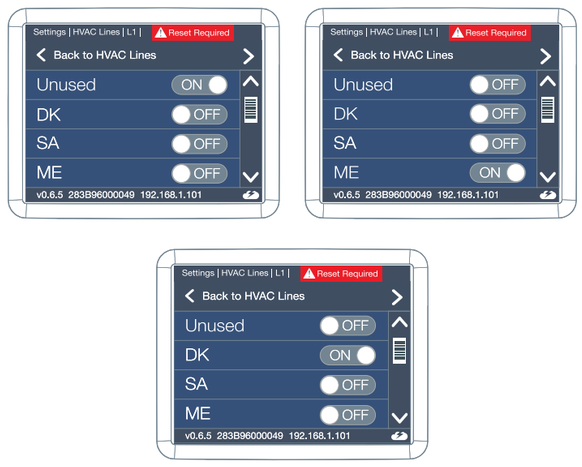
2 Go to HVAC Line



3 Select the HVAC Line you want to configure



4 Configure the HVAC line type



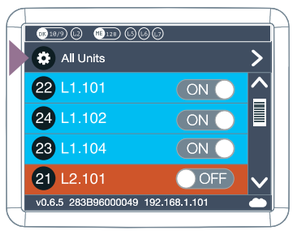
5 Make sure the DIP switches are set properly for the brand (according to the details in the brand relevant section above)

6 You will also have a red warning message if DIP switch are set incorrect

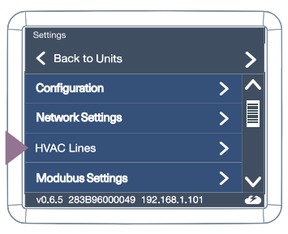
7 Reset is required to make the change

Scanning for indoor units

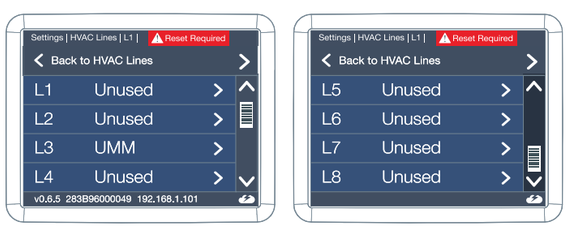
1 Go to Settings



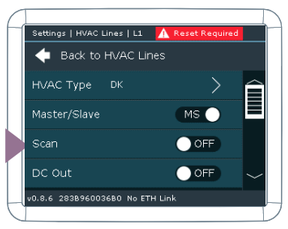
2 Go to HVAC Line



3 Select the HVAC Line you want to configure

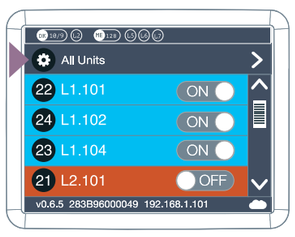


4 Press Scan

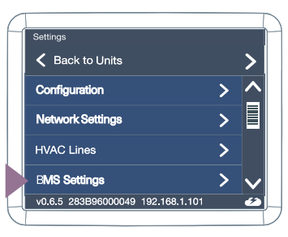


Enabling Modbus IP

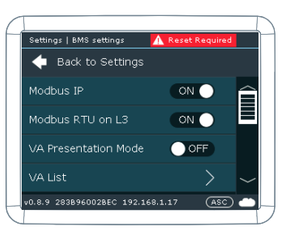
1 Go to Settings



2 Go to BMS Settings

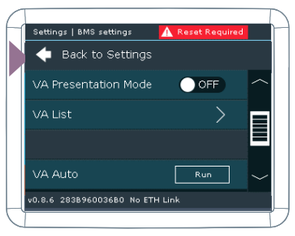


3 Enable Modbus IP

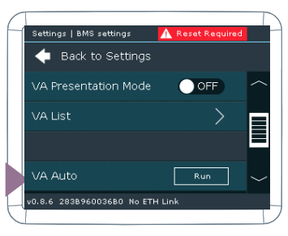


Creating VA list

1 Run VA Auto



2 View VA List



For full instructions please refer to the CoolMasterNET documentation here https://coolautomation.com/wp-content/uploads/sites/2/2021/03/CoolMasterNet_UM_v1.1.2-1.pdf

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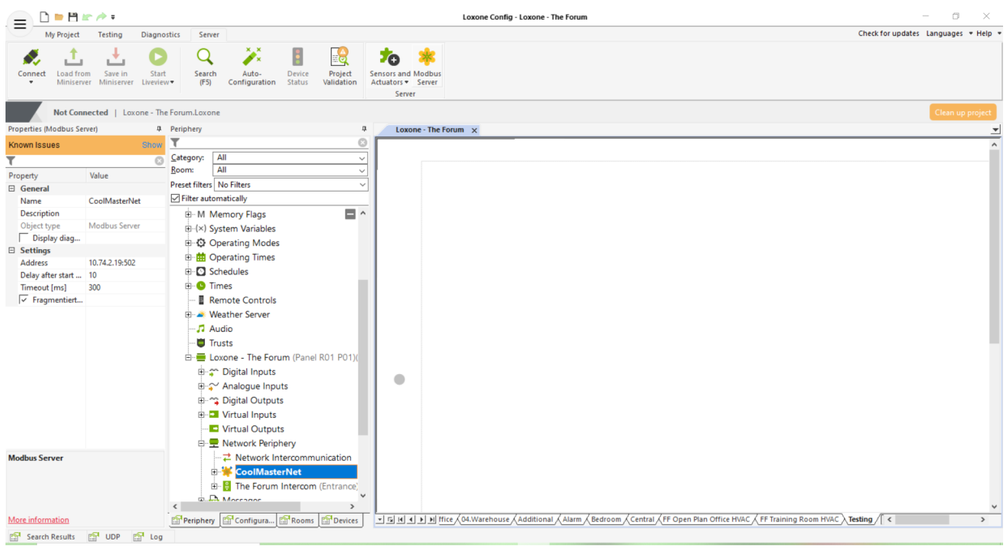
Step 3: Configuration in Loxone Config

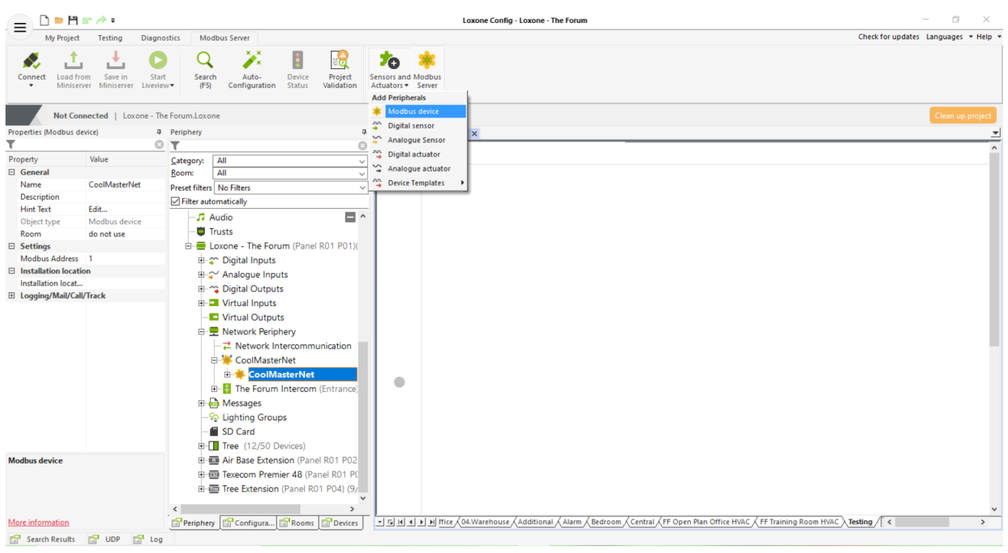
The CoolMasterNET uses an offset of 16 for each Virtual Address (VA) for the indoor units. This means that within Config the IO addresses will start at 16 for VA1, 32 for VA2, 48 for VA3 etc... All registers are 16 bit unsigned and we recommend always using command 6 - preset single register for actuators, command 3 - read holding register for sensors.

Create Modbus server



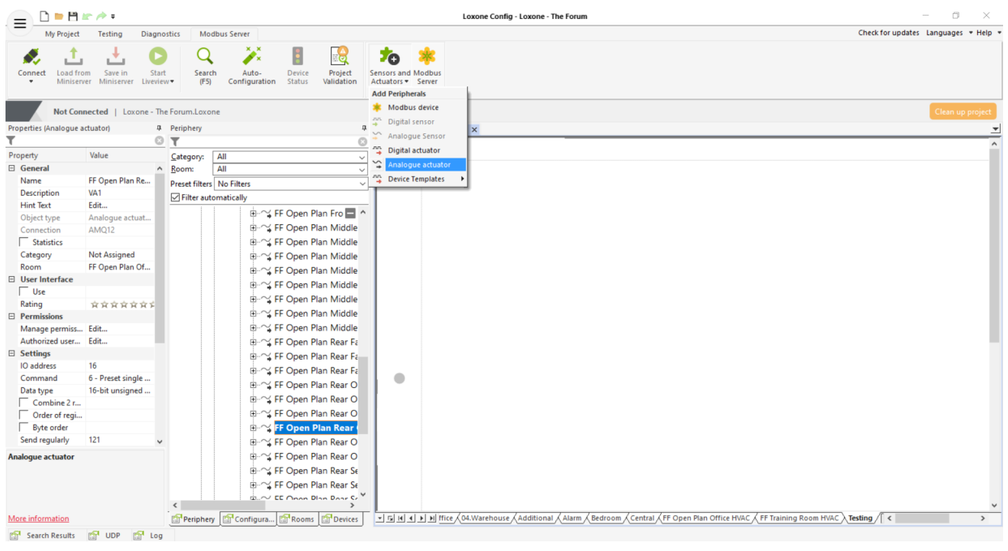
Select 'Network Periphery' in Config, then at the top ribbon click 'Modbus Server'. This will add the Modbus server to the periphery list. Then fill out the parameters for the IP address of the CoolMasterNET and the port (default port is 502)

Create Modbus periphery



Select the Modbus Server in the periphery list and then select 'Sensors and Actuators' from the ribbon. Click 'Modbus device' this will create an address beneath the server. The default address will be 1.

Create Sensors and Actuators



Select the Modbus device then select 'Sensors and Actuators' from the ribbon. Create inputs and outputs as required. We recommend all sensors and actuators be 'Analogue' to be able to correctly set the command type.

When creating Actuators, certain ones such as 'Mode', 'Set Temperature' and 'Fan Speed' can be useful to 'Send regularly' to ensure that the commands are not missed by the unit if the values are changed

LOXONE

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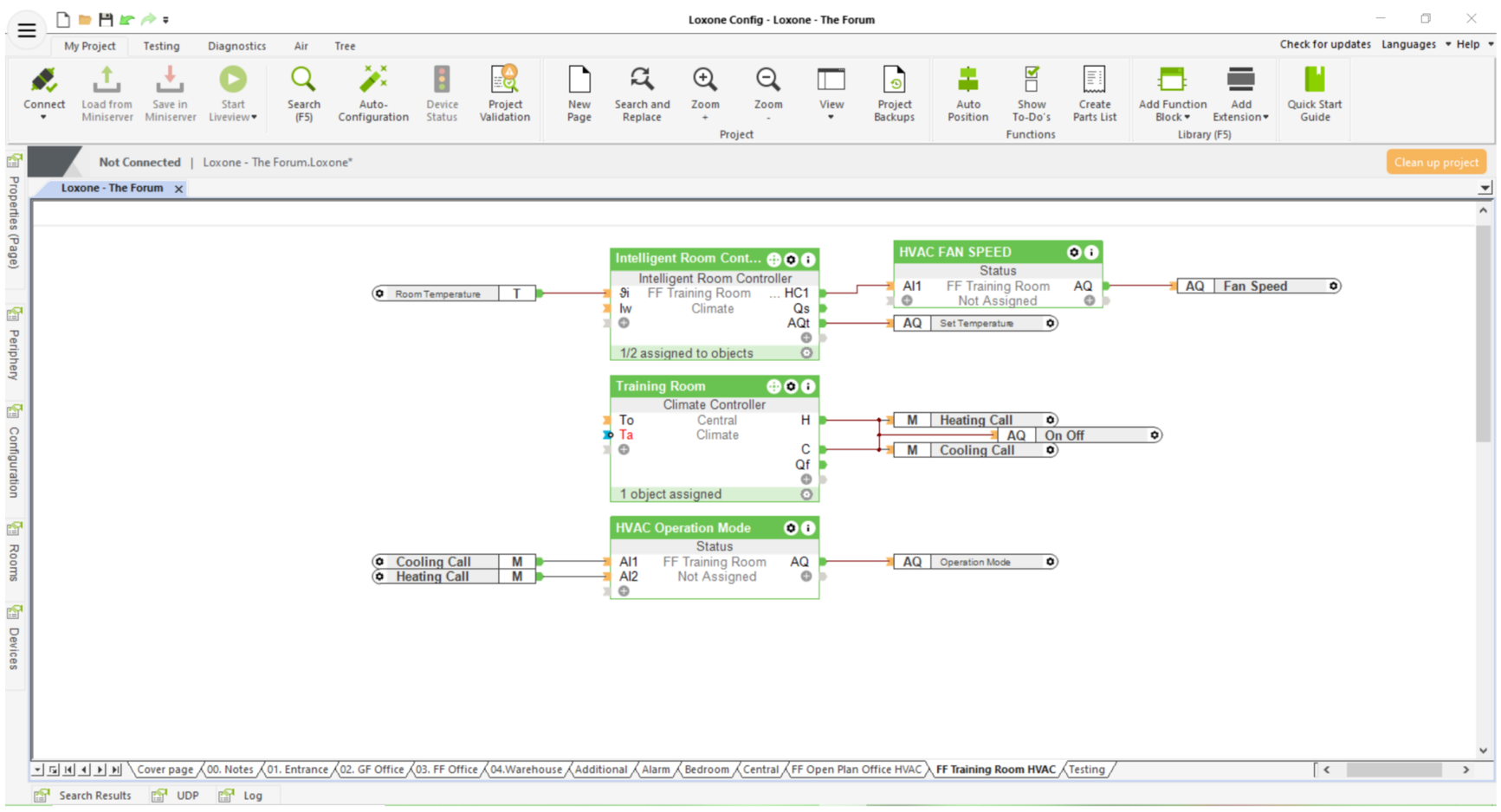
Step 4: Modbus Registers and Config Example

	Operation Mode	Fan Speed	Set Temperature	On/Off
VA001	IO Address 16 0 - Cool, 1 - Heat	IO Address 17 0 - Low, 1 - Med, 2 - High	IO Address 18 Multiply value x 10	IO Address 19 0 - Off, 1 - On
VA002	IO Address 32 0 - Cool, 1 - Heat	IO Address 33 0 - Low, 1 - Med, 2 - High	IO Address 34 Multiply value x 10	IO Address 35 0 - Off, 1 - On
VA003	IO Address 48 0 - Cool, 1 - Heat	IO Address 49 0 - Low, 1 - Med, 2 - High	IO Address 50 Multiply value x 10	IO Address 51 0 - Off, 1 - On
VA004	IO Address 64 0 - Cool, 1 - Heat	IO Address 65 0 - Low, 1 - Med, 2 - High	IO Address 66 Multiply value x 10	IO Address 67 0 - Off, 1 - On
VA005	IO Address 80 0 - Cool, 1 - Heat	IO Address 81 0 - Low, 1 - Med, 2 - High	IO Address 82 Multiply value x 10	IO Address 83 0 - Off, 1 - On



Important Parameters:

Climate Controller:

- Heating Type - Oil/Gas
- Mode - 0

Fan Speed Status Block:

- AI1 0-10 scaled to 0-2

Operation Mode Status Block:

- AI1 = 1 - State Value - 0
- AI2 = 1 - State Value - 1

Set Temperature Actuator - Correction Values:

- Input Value 1 - 0
- Target Value 1 - 0
- Input Value 2 - 10
- Target Value 2 - 100

For full details on the CoolMasterNET Modbus specifications please refer to the manual here http://coolautomation.com/Lib/doc/manual/Modbus-guidelines.pdf